

# SANDIA LAB NEWS

VOL. 20, NO. 19, SEPTEMBER 20, 1968

CRYSTAL STRUCTURE of silicon and results of neutron-irradiation damage were the basis for technical paper by Herman J. Stein (5111) which has won an "outstanding paper" award from the IEEE Conference on Nuclear and Space Radiation Effects.

## Nuclear Effects Paper Receives IEEE Award

Herman J. Stein (5111) has been informed that he will receive an award in recognition for an outstanding paper presented during the recent annual IEEE Conference on Nuclear and Space Radiation Effects.

His paper was entitled "Electrical Properties of Neutron-Irradiated Silicon at 76°K; Hall Effect and Electrical Conductivity." Mr. Stein explains, "The results of this study indicate that the clustered nature of neutron-produced defects plays a significant role in the electrical properties of neutron-irradiated silicon." His studies in this particular area have spanned three years, although he has been concerned with problems in radiation damage since coming to Sandia 12 years ago. His research has involved the use of Sandia's nuclear reactors, Cobalt 60 sources, and Van de Graaff accelerators.

Mr. Stein has been associated with the Crystal Lattice Defects Research Division for the past three years. He has an MS degree in physics from Oklahoma State University and a BS degree in science from Central State College, Edmond, Okla.

This will be the fourth time a Sandia scientist has received the outstanding paper award since it was initiated for the IEEE Conference in 1964. Previous recipients from Sandia were F. M. Smits (now Bell Telephone Laboratories) and C. A. Goben in 1964, H. H. Sander and B. L. Gregory (both 5112) in 1966 and, in 1967, C. W. Gwyn (5112), J. L. Wirth (9320), and Donald Scharfetter of Bell Telephone Laboratories.



SHARE A LITTLE SUNSHINE is the theme of this year's Albuquerque United Community Fund campaign. Bill Laskar (3432), LAB NEWS

photographer, created these dramatic scenes to illustrate the advertising of the local UCF effort in both newspaper and television.

## Check 'Fair Share' Option

# ECP Campaign Starting Monday

On Monday, Sept. 30, all employees will receive a letter from the Employee Contribution Plan committee urging continuing support for the 29 local and eight national agencies involved in the Albuquerque United Community Fund.

Goal of the Sandia drive is a fair share contribution from all employees. A fair share is defined as one hour's pay per month. Some 2810 Sandians are fair share contributors while another 3085 contribute varying percentages of a fair share.

The average gift per contributor is \$45.79 annually.

Sandians are contributing a total of \$280,000 to ECP this year on pledges made a year ago. This is an impressive figure, and it is impressive that 86 percent of Sandia employees are enrolled in ECP.

"This represents a maturity in our Plan," ECP committee chairman Hank Willis (3130) says. "Sandians realize that the payroll deduction method of making a gift is the easiest, most efficient way to meet

community responsibilities. The small monthly contribution adds up to a sizable amount by the end of the pledge period. There is a great deal of satisfaction for all of us at Sandia in knowing that we are responsible members of the community who meet our obligations.

"Still," Hank continues, "the committee has to look at a figure like \$508,000 which is what Sandians would contribute to ECP if everyone made a fair share contribution."  
(Continued on Page Two)

## Dual Environment Testing

# Twin Shakers Added to Giant Area III Centrifuge Facility



MASSIVE 30-TON ARM of Sandia's underground centrifuge now has twin shakers mounted on one end to provide acceleration and vibration environments simultaneously. The forces duplicate the conditions

of rocket launch. Units over a wide range of weights may be subjected to the dual environment. For acceleration tests up to 100 G, the centrifuge can handle test units weighing up to eight tons.

The forces of linear acceleration and vibration may now be applied simultaneously to test units on Sandia's huge underground centrifuge in Area III. Two Ling Model 300 shakers, with a total vibratory force output of 16,800 pounds, have been mounted on one end of the 51-foot arm of the centrifuge. The two shakers face each other and are driven 180 degrees out of phase in a push-pull arrangement.

The facility is operated by Environmental Testing Department 7320 under G. H. Roth.

A Team Corporation hydrostatic table links the two armatures together. The test item is mounted on the table and subjected to linear acceleration (from the centrifuge) and sine, random or complex vibration (from the shakers). This dual environment simulates the conditions of a rocket launching.

Test items weighing up to 100 pounds may be vibrated in a linear acceleration field of 100 g, while heavier units may be vibrated in lower linear acceleration fields.

Future modifications to the system will allow temperature conditioning of the test item. It will then be possible to cool or heat the test item in the temperature range from -60° F. to +300° F. This additional capability will enable testing under the combined environments of linear acceleration, vibration and temperature.

Since the underground facility was completed in mid-1964, it has been used for linear acceleration testing only. The centrifuge was designed by Facility Engineering Division 7311 for use by Area III Vibration, Acoustic, and Centrifuge Division 7324. The first aim of the centrifuge  
(Continued on Page Two)

## Editorial Comment

# Share a Little Sunshine

Albuquerque is our town. We live here.

As a place to live, it's hard to beat. The city is about the right size—big enough to offer metropolitan features, small enough to remain friendly. The Sandia Mountains are not yet blocked from view by our growing number of high-rise buildings. And the sun shines just about every day.

Like most growing cities, though, we have our problems—people problems. These are our neighbors who, in some cases, are in dire need. For those who experience it, dire need is never simple, although sometimes simply a pair of shoes for a little girl means the difference between going to school or staying home. Still, there are complex forces behind her lack of shoes.

Only a continuing many-faceted program can hope to solve the complex problems of people in dire need.

The Albuquerque United Community Fund has been conducting such a program for years. Twenty-nine separate agencies run a coordinated program to take care of the people problems in Albuquerque. It is a continuing effort that has gained much success and marked many milestones along the way. But the work is never finished. People continue to have problems.

Just once a year the residents of Albuquerque are asked to help these agencies continue their work. Everyone is asked to give a "fair share" contribution—one hour's pay per month. If everyone at Sandia Laboratories made a fair share contribution, the amount raised would total \$508,000.

This amount would go a long way toward financing the work of the 29 UCF agencies. In addition, eight other national agencies receive a small percentage of the funds—agencies such as the Cerebral Palsy Association which provides help for those who suffer from this incurable condition. People problems are never simple.

We are asked to give our fair share. The need is great. As residents of Albuquerque, we can do no less. It's our city. Share a little sunshine.



MARY LOU MICKEY (center), 14-year-old daughter of Tom Mickey (4232), worked this summer as a volunteer helper at the New Mexico Rehabilitation Center. Mary Lou has made a remarkable recovery from cerebral palsy. Her volunteer work is her way of giving a "fair share."

## Mary Lou Mickey, Cerebral Palsy Victim, Gives Her 'Fair Share'

This is a success story with a heroine and a villain. Even though it is a success story for the heroine, the villain still wins because cerebral palsy is incurable. You can repair the damage wrought by the villain, adjust to the permanent marks that are left, and take hope from the courage of the heroine.

The heroine is Mary Lou Mickey, 14-year-old daughter of Tom Mickey (4232). Mary Lou was born with cerebral palsy—brain damage and loss of motor control from birth. This is the villain.

She did not take a step until she was three and a half years old. She has undergone a number of operations for muscle grafts. And she has spent endless hours in physical therapy—much of it at the UCF-supported New Mexico Rehabilitation Center.

Mary Lou takes part in normal childhood activities now. She's bright, quick, friendly and sometimes a little tense because she tries so hard to be a normal active child. She still limps a little, her right arm is not always under control, and she has difficulty with pronunciation of long words.

Mary Lou defeated the villain through tremendous personal effort. She worked for years on her exercises, still works as hard as any athlete on these exercises. And her courage through the series of operations was remarkable.

Now that Mary Lou feels able to take care of herself (learning to comb her hair and button buttons were tremendous victories), she wants to help other people.

This past summer she worked as a volunteer three mornings a week at the Rehab

Center. She took care of the younger children waiting for therapy. She kept the playroom neat. She explained the games, participated in the play. More than this, she showed the other children that they can hope to overcome a cruel affliction.

People who work for UCF agencies (there are 6000 volunteers in Albuquerque) take pride and satisfaction from success stories like Mary Lou's. Although Tom Mickey paid for his daughter's years of treatment and therapy, the Rehab Center is largely financed through UCF funds.

Tom served for a couple of years as a member of the local board of the Cerebral Palsy Association, a national agency dedicated to the defeat of the villain through treatment and research.

"There is never enough money for the Cerebral Palsy Association," Tom says. "The other agencies, too, make necessary compromises in their programs between what could be accomplished if they had enough money and what can be accomplished with the money available."

The Cerebral Palsy Association is one of the eight national agencies receiving funds from Sandia's Employees Contribution Plan. Sandians will be asked to make a fair share contribution when the drive starts at the Laboratory Sept. 30. A fair share is one hour's pay per month.

Mary Lou donated three mornings a week at the Rehab Center this summer. Next summer she wants to be a candy-striper working in a hospital. Eventually, she hopes to become a nurse.

With her courage, she can be anything she wants.

## Continued from Page One

# ECP Drive Starting

tribution. Our job is to keep urging those who are not yet fair share contributors to check this option on the payroll deduction card which will be distributed with the letter Sept. 30.

"Like every other feature of American life, the operating costs of UCF agencies have increased, the case loads are up and new equipment and staff are needed. These are vital, pressing needs. The UCF goal for Albuquerque this year is \$1,350,000. I urge everyone to make a fair share contribution."

Eighty-two percent of the total collected by ECP goes to the 29 agencies of the Albuquerque UCF. The remainder of the ECP is divided among eight national agencies. The national agencies are the American Cancer Society, Bernalillo County Heart Association, Cerebral Palsy Association, Muscular Dystrophy Association, Arthritis Foundation, Multiple Sclerosis

Society, New Mexico Society for Crippled Children and Adults, and Cystic Fibrosis Association.

Members of the Sandia ECP committee include Mr. Willis, L. M. Berry (5430), A. N. Chaves (4615), D. M. Fuller (9423), Marian Jacot (3251), M. A. Martegane (3242), H. R. Welch (4514), R. L. Wilde (1213), W. L. Stevens (1650), W. C. Riggan (2614), and J. P. Cavanaugh (4131).

## Continued from Page One

# Twin Shakers On Centrifuge

program was to develop the linear acceleration system; the second phase was the addition of a vibration system.

For linear acceleration, the centrifuge is capable of testing an eight-ton test unit (including fixture weight) to 100 g (or 108 rpm) and restraining a static load of 1,600,000 g-pounds. Or, a four-ton test unit can be tested in a 200 g linear acceleration field. At this level, the centrifuge is rotating 154 revolutions per minute and the tip speed is 320 mph.

The tremendous forces generated by the moving 30-ton arm of the centrifuge are absorbed by a special steel and concrete base (reaction mass) weighing 225 tons.

Currently, the dual environment capability of the centrifuge is being checked out by a team from Facility Engineering Division 7311 and Area III Vibration, Acoustic and Centrifuge Division 7324 personnel.

Check-out is being combined with actual test programs because of the heavy work load. John Otts, Division 7324 supervisor, is confident that the centrifuge will perform to design specifications when check-out is completed.



TWO CLASSES of apprentices completed four-year training programs recently. From left are Santiago Abeyta, Howard Sanchez and Edmundo Sisneros who completed the electronics program. Next is Jim Reck, supervisor of the Electronic Apprentice Section 4231-4. Graduates of the machinist program are Keith Gawith and Jacob O. Young, son of Jacob E. Young, Jr. (right), president of Metal Trades Council. Sandia's apprenticeship programs are administered through a joint management-union committee.

## SANDIA LAB NEWS



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8170: M. J. Brenton (8171), G. H. Funk (8172), M. H. Nelson (8174).

8180: D. L. Werner (8181-8184), W. R. Long (8182), R. B. League (8182-1), J. E. Leeper (8183), R. D. Culy (8183-1).

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8220: E. C. Deno (8222-1), T. R. Silva (8222-1), A. B. Harrison (8222-2), C. H. Johnson (8223-1), B. E. Affeldt (8223-2), J. C. Trembl (8223-3), L. B. Green, Jr. (8223-5-8226-2).

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8310: J. P. Darginis (8311), R. W. Weaver (8312), T. L. Bryant (8312-1), P. E. Dodge (8313-8314), J. E. Brown (8314).

8320: C. H. Turnbull (8321), G. L. Williams (8322-8324), K. A. Oatney (8322-1-8322-2), H. L. Brint (8323).

8330: G. E. Dietel (8331), B. A. Worden (8331), R. L. Jones (8332), H. R. Johnston (8333), W. E. Brock (8333-1), O. H. Criner (8334).

9100: W. L. Whitney (9125-1), R. J. Burton (9132-1).

# LIVERMORE NEWS

VOL. 20, NO. 19

SANDIA LAB NEWS

SEPTEMBER 20, 1968

## Goal Is \$26,500

# United Bay Area Crusade Starting Here Monday

The 1968 United Bay Area Crusade campaign to raise \$26,500 for 176 health, welfare and recreation agencies serving the people of the five-county Bay Area starts at Sandia Laboratories Livermore, Monday, Sept. 23.

On that day and the following Tuesday and Wednesday, employees are scheduled to attend a meeting to learn the needs of

the 1968 United Bay Area Crusade (UBAC). The meeting includes a showing of a 10-minute film entitled "People Need Help," and a five-minute talk on the impressions Laboratory employees received after a recent visit to two of the agencies receiving funds from UBAC. Following the meeting, a contribution pledge card will be distributed to each person.

# Employees Tell About Visiting Crusade Agencies

We left the Laboratory parking lot at 9 a.m. and headed northwest up the freeway, across the Bay Bridge, and down into the heart of San Francisco's Fillmore district.

This was the day a group of Laboratory people working on the United Bay Area Crusade would see first-hand two of the agencies receiving support from the Crusade. We had chosen the Youth for Service (YFS) and the East Bay Work Training Center.

Pulling up in front of an old store on McAllister Street, we climbed three flights of stairs to the office of Percy Pinkney, Director of Streetworkers for the YSF organization. Mr. Pinkney assured us we were in the heart of a ghetto and, as he termed it, "in sin center."

The first person who spoke to us, Jean Kimes, conducts classes for men whose lack of education or whose frustration in job seeking has caused them to lose their self-confidence. "To see it return is a tremendous experience," says Miss Kimes.

This organization has worked successfully with delinquent and social underprivileged youths to help them gain education and employment. Since its organization in 1959, over 500 work projects have been completed by youths for the welfare of the entire community. Using materials provided by local businessmen, they have built mini-parks, painted houses of welfare recipients, and assisted the handicapped. They may also participate in any of the various programs conducted by the Service in cooperation with city, county and federal agencies and industrial firms.

Speaking on other activities of YFS, Mr. Pinkney said, "Our agency tries to keep peace in the city. The core of the agency is the streetworker — usually an ex-gang member who returns to the ghetto as a representative of society. Streetworkers are with the young people 24 hours a day. They know youths' hang-outs and hang-ups. They know who is shooting smack (using narcotics) and those who show their anti-social behavior by stealing hubcaps. Streetworkers solve the nitty-gritty problems. They also guide young people toward Youth for Service where we try to gain their self-confidence. We try to instill in them a sense of pride and the value of their contributing to society."

Operation "Sparkplug" takes hard-to-employ young men with minor police records, trains them under the auspices of Standard Oil of California, and puts them to work in San Francisco service stations. Operation "Livewire" is a similar recruiting and training program conducted in cooperation with the Pacific Telephone Company. The Neighborhood Youth Corps, another branch of YFS, teaches and gives

counsel to high school dropouts and places them in jobs with various non-profit agencies in San Francisco. They are also encouraged to spend eight hours a week in classroom study. Under Operation "Minerva," other high school dropouts are counseled and tutored to help prepare them for college training at the City College of San Francisco. Thirty students now participate in this program.

After leaving the Fillmore area, we drove to the East Bay Work Training Center in San Leandro.

The Center helps the mentally retarded develop work skills and productivity by providing paid work to trainees and by encouraging their personal and social development.

Located on Bancroft Street in San Leandro, the Center occupies bright, airy quarters for up to 70 people in five work areas. Trainees 16 or older spend four and one-half hours a day at the Center doing contract work such as washing fleet vehicles for Montgomery Ward or gift-packaging products for Spice Islands. If contract work is slack, the trainees make salable products using the skills they have learned at the Center. The products are functional as well as decorative and include ceramic ash trays and planters, hand-sewn dresses, aprons and dishtowels.

"It is our hope," says Mrs. Frances Costa, director of the Center, "that our trainees learn enough to get employment in industry or to attend better equipped vocational rehabilitation centers. We'd like to place them where they may be gainfully employed to the utmost of their capacities. Some former trainees now work a 40-hour week at the Post Office or Good-

will Industries. Those who are not ready for regular employment are given a feeling of self-worth at the Center by receiving remunerative employment for their efforts."

Both Youth for Service and the East Bay Work Training Center are doing a tremendous job with the money and facilities available. Both would like to expand and do more. Mr. Pinkney says, "I sometimes don't know how we are going to pay our staff the following week." Mrs. Costa hopes that one day they can build another center in Oakland to help the many people in this area who want and need this service. "After six months here we usually see a remarkable change not only in the trainee but also in his parents

or guardians. Our program gives them a whole new lease on life," says Mrs. Costa.

These are just two of the 176 agencies that receive Crusade funds. After talking with such totally dedicated people as Miss Kimes, Mrs. Costa and Mr. Pinkney, we can assure you that your money is being used wisely.



"It is our hope that the trainees learn enough here to get employment in industry."

Arley Turner (8223-5) and Carl Holmes (8333-1).



"We try to give our people a feeling of self-worth."

(Background L to R) Greg Jones (8252-5), Mike Birnbaum (8314) and Bob Norvill (8233).



"The streetworkers know the youth's hang-outs and hang-ups. They know who is using drugs and those who show their anti-social behavior by stealing hubcaps."

(L to R) Percy Pinkney (Youth for Service), Mike Birnbaum (8314), Larry Dorety (8174), Greg Jones (8252-5) and Arley Turner (8223-5).

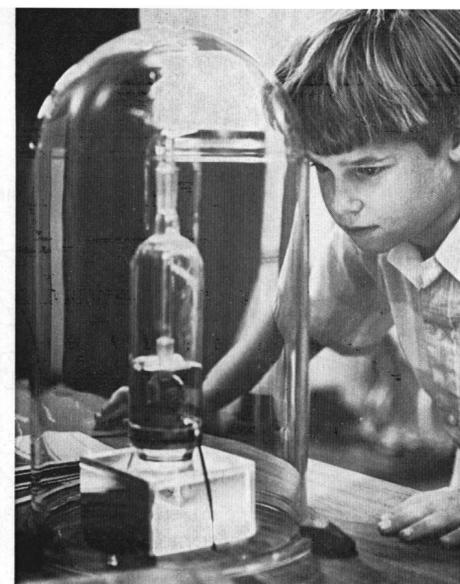


"This area was formerly a pile of rubble until our boys turned it into a park."

(L to R) Karen Medeiros (8242), John Smith (Youth for Service).



Visitor learns the attitude control system guides rocket by locking onto the sun.



An Ion Drag Pump, of course . . . .



Spark is produced when piezoelectric ceramic discs are squeezed.

The Spectrum of Science

# SANDIA'S 1968 STATE FAIR EXHIBIT

Hundreds of State Fair patrons visited Sandia's exhibit in the Industrial Building this week. The Fair will continue through Sept. 22.

Above: Dramatic color photograph display holds attention.



Right: Unusual parachute, the Parafoil, intrigues . . . .



Left: Science is fun, Bob Gall, Community Relations Division 3433, successfully explains.

Right: Dart parachute test vehicle is studied by youngish scientist.



## Take Note

H. J. Stein (5111) was one of five guest lecturers at a short course on Radiation Effects in Semiconductors — Advanced Topics held at the University of Missouri Aug. 26-30. The course was designed for individuals beginning or contemplating work in the field of radiation-produced defects in semiconducting materials or devices. The 20 attendees were from industry, government laboratories and universities.

Team 2400 is the slow pitch champion of Sandia Laboratories. The champs came out of the losers bracket during the recent tournament to defeat Team 21-25-31-7200 twice in the finals. The scores were 7-5 and 11-10.

Members of the team include Jim Mason (2454), Norm Siska (2453), J. R. Rosborough (2451), J. A. Abbott (2454), D. A. Branscombe (2451), Tom Kelly (2441), M. C. Nukaoki (2452), Archie Sorley (7453), T. L. Cordell (1516), B. R. Emrick (1516), R. C. Beckmann (1212), R. D. Andreas (1221), R. B. Yingst (2400), D. M. Talbert (1221), D. R. Deatherage (2452), and R. K. Treece (2442).

Team 2400, last year's champions also, finished the league with a 21 won, 3 loss season record. As far as anyone can recall, this year was the first time any team came out of the loser's bracket (having lost during the first round of tournament play) to take the championship.

### E. S. Roth Presents Cost Savings Clinic

A manufacturing engineering clinic, "Cost Savings Through Design Clarification," was prepared and conducted under the direction of E. S. Roth of Process Application Division 5434. The clinic, sponsored by the American Society of Tool and Manufacturing Engineers (ASTME), was held in Boston, Sept. 9-13. Course content emphasized how to produce major cost savings by reducing the number and complexity of tool, gage and inspection operations. It provided a general survey of functional processing including design, tooling, gaging or inspection, and final acceptance.

### Welcome . . . Newcomers

Aug. 29 - Sept. 13

Albuquerque	
John J. Aragon	4233
Daniel R. Archuleta	4254
Margaret Atencio	4643
Agnes T. Chavez	3253
Gloria M. Chavez	3126
Joyce L. Coffee	3126
Charles P. Conley	4233
Donald L. Cooper	4233
D. W. Fenstermacher	3415
*Viola A. Folkins	3126
Lons Rae Frazee	3126
Betty C. Good	3126
Linda Sue Gurule	3253
Gary W. Kelton	4233
Margaret A. Kirchner	3231
Janice T. Kowalski	3126
James J. Landavazo	4233
Jerry Landavazo	4622
Karen M. Lowry	3126
Albert Maas II	3415
Mary S. Martin	3126
Marla J. Mortensen	3126
Paul Nelson, Jr.	9142
Jacobo Orona, Jr.	4574
Fidel J. Perez	4254
Raymond Perry	4254
Ray E. Peter	4254
William D. Poole	4254
Don D. Sandoval	3415
Jon B. Toops	5243
Michael A. Valerio	4254
Irl M. Vance	4254
Anna M. Velasquez	3231
M. Evelyn Vigil	3232
Alabama	
Arthur R. DuCharme, Jr., Birmingham	5273
Colorado	
John P. Connolly, Windsor	3111
Billy I. O'Neal, Fort Collins	3312
Robert C. Reuter, Jr., Denver	1541
Illinois	
Lloyd B. Bonzon, Urbana	9142
Indiana	
Michael C. Rex, Fort Wayne	4114
Minnesota	
Robert J. Erlandson, Minneapolis	2000
Roy Y. Lee, Minneapolis	1712
New Mexico	
Jacob N. Sanchez, Central	4153
New York	
Robert Gerlach, Ithaca	5273
Pennsylvania	
*Dale R. Shenk, Beaver	7612
Texas	
Robert A. Keeling, Dallas	4113
James R. Kelsey, Austin	9325
* Retired	

### Congratulations

Mr. and Mrs. Robert R. Kissam (2554), a daughter, Stacy Lorrain, Aug. 20.  
Mr. and Mrs. Bennie Chavirra (4574), a son, Sept. 8.

Two members of Industrial Hygiene Division 3311 have been elected officers of the Rocky Mountain Section of the American Industrial Hygiene Association. Lial Brewer is president-elect and Ken Skillern is secretary-treasurer. The Rocky Mountain Section includes New Mexico, Colorado, Wyoming, Utah and a part of Texas.

Annual meeting of the Rocky Mountain Section will be held in Denver Sept. 27-28. Don Parker (3311) will present a paper, "Sandia Laser Safety Standards."

### Retiring



Rosalio A. Silva, an automotive serviceman at Sandia for 17 years, will retire Sept. 30. He has been with Vehicle Maintenance Section 4573-2 the entire time.

Mr. and Mrs. Silva will continue to live in Albuquerque at 502 Maricopa Dr. SW. Five of their 10 children are living at home. One son, Antonio, also works at the Laboratory in Control Section 9411-5.

In December, Rosalio and his family will travel to Los Angeles where two of his children live. Other retirement plans include some extensive remodeling on his house and lots of gardening activity next spring.

"I have been really happy working at Sandia," Rosalio says, "and I hate to leave." His co-workers agree—they too hate to see him leave.



Fae M. Parker, a data analyst in Data Center Division 9413, is retiring Sept. 30. She was employed by Sandia in April 1955 as a film reader and editor in field test. About a year later she transferred to the computer group as an operator and has been in her present position since 1964. Before joining Sandia, she taught school for 10 years.

Mr. and Mrs. Parker have two married sons and four grandchildren. Mr. Parker is a retired American Red Cross Field Director.

"Sandia's retirement plan makes it possible for me to retire early," Fae says. "Since my husband is retired, I decided not to delay any longer, but to take early retirement so we'll be able to enjoy more time together."

Fae is looking forward to "getting off schedule" and resuming interests and activities that have been put off for many years. She is interested in genealogy, flower arranging, sewing and bridge. She also does committee work for social organizations and her church. Fae shares her husband's interest in hunting and fishing. The Parkers have a travel trailer and own a cabin on the Brazos River. Included in their plans are hunting and fishing trips.



Thelma B. Carpenter, secretary to the Director of Plant Engineering and Maintenance 4500, is retiring the end of this month. She joined Sandia 17 years ago and advanced from a plant engineering division secretary to department secretary, and in April 1962 to her present position.

Thelma has a daughter living in Fort Carson, Colo., and a son in Phoenix. She has nine grandchildren. For the present, her retirement plans are centered around her family. She plans to move to Fort Carson for a time to be near her daughter and family. Eventually she may decide to make her home in Phoenix.

She has no definite schedule but does plan to make a trip east to visit relatives in Michigan, New Jersey and New York.

# New Type Lock Developed



O. M. Stuetzer

A unique electric combination lock is a new patent to come out of piezoelectric research and development at Sandia Laboratories. The patent for this "piezomechanical locking mechanism" was assigned to the Atomic Energy Commission this summer in the name of Otmar M. Stuetzer (1220).

The lock's special features, as described in the patent, include resistance to picking and difficulty in circumventing the combination. And each unsuccessful attempt to crack the combination may make successful picking even more difficult.

A test model built in the laboratory by Richard D. McKee (5241) indicates that this type of lock could be rugged and relatively simple to construct because few moving parts are needed. However, Sandia has no application for the mechanism, according to Mr. Stuetzer, and therefore has no design or production experience with it.

The mechanism of the lock, according to Mr. Stuetzer, depends upon the properties of ferroelectric ceramics such as lead zirconate titanates—PZT-5, for example.

PZT-5 and most of the other ferroelectric ceramics used at Sandia are man-made materials that become piezoelectric when electrically polarized. That is, when electrical fields are applied to these polarized ferroelectrics, they produce small dimensional changes.

The direction of these small expansions and contractions in the ferroelectric material is determined by the direction of the applied field and the direction of the polarization. This characteristic is the basis of Mr. Stuetzer's lock (see drawings).

The locking-unlocking combination is actually an electrical code. The code is set by inserting any number of polarized PZT-5 discs in any desired sequence of negative and positive directions. Release of the lock elements requires that they all contract away from the housing, and this takes place only when positive and negative fields are applied in the right directions. The code may be reset by repolarizing one or more of the discs.

This type of lock has advantages over both mechanical combination locks and code locks depending upon electronic memory.

The difficulty of opening a mechanical combination lock is neither increased nor decreased by wrong tries. But electrical fields applied to the piezomechanical lock in the wrong direction may produce changes in the ceramic which would increase the difficulty of picking the lock.

Electronic memory circuits may be circumvented by applying voltages at proper points and the memories may be erased by strong magnetic fields. Circumvention of the piezomechanical mechanism is much more difficult, and its memory is relatively insensitive to high magnetic fields.

Sandia is one of several laboratories which have become increasingly active in piezoelectric research over the last 15 years, and the piezomechanical lock is one example of spin-off from the Sandia program. The piezoelectric effect itself, however, has been known since 1880.

French chemists Pierre and Jacques Curie found that applying pressure to certain crystals produced an electric potential proportional to the force applied. In turn, applying electrical potential to the crystal produced a proportionate constriction.

Pierre later worked with Polish chemist Marie Sklodowska to develop the first application of piezoelectricity—a laboratory instrument for measuring the radioactivity of uranium. (Other direct and indirect results of their collaboration were Marie Sklodowska Curie's two Nobel Prizes, and Eve Curie, later a Nobel laureate in her own right.)

Major applications of piezoelectricity in the last 50 years have been in sonar (developed for detecting submarines in World War I), phonograph pickups, and electrical circuit frequency control—all in the electroacoustic area.

However, piezoelectric devices can be categorized according to five kinds of outputs: mechanical, acoustic, electrical, optical, and thermal.

One of the most widely used piezoelectric devices developed at Sandia is the electrical-output "piezoelectric stress gage". A patent for the gage was assigned to the Atomic Energy Commission last year (Lab

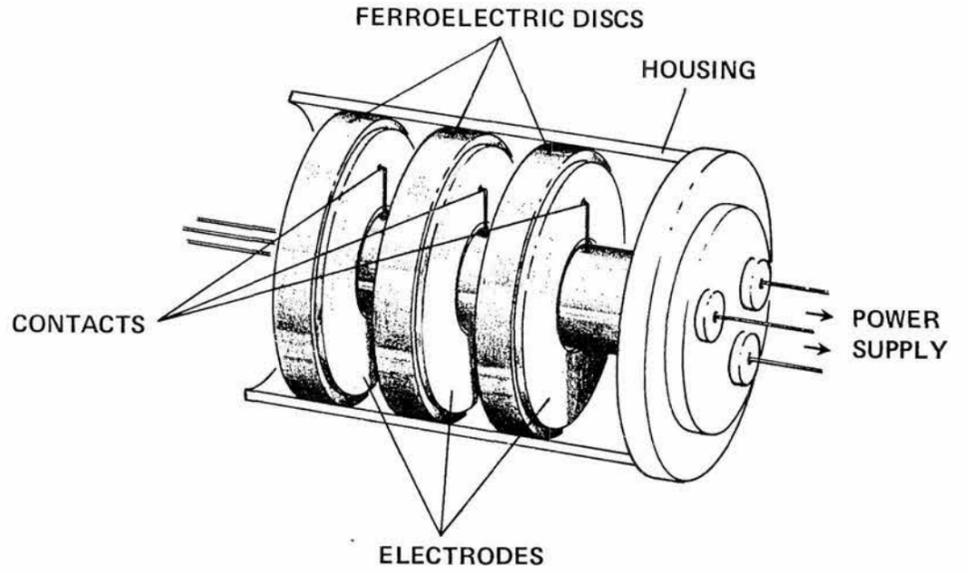
News, 4/7/67) in the names of Frank W. Neilson (5240), Robert A. Graham (5132), and William B. Benedick (5131).

The device, commonly known as the Sandia quartz gage, depends upon the electromechanical characteristic of man-made quartz crystals. Shock pressures on the crystal produce measurable electric current in direct proportion to the magnitude of the shock. These quartz gages, now manufactured commercially, can measure high shock pressures of very short duration—a millionth to a thousand-millionth of a second ( $10^{-6}$  to  $10^{-7}$ ).

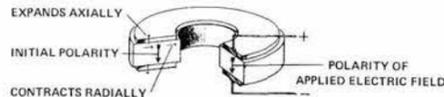
Two noteworthy optical-effect devices under development at Sandia are the two-state and multi-state ceramic memory elements of Cecil E. Land and Ira D. McKinney (both 5153) and Gene H. Haertling (2317) (Lab News, 10/20/67).

In these devices, the optical transparency depends upon the alignment of electrical charges in a ferroelectric ceramic. A microminiature electrode system makes possible the storage of 5120 separate bits of information on a square inch of a coarse-grained ceramic, five times the density of conventional memory devices used in computers. Fine-grained ceramics of high optical resolution may also have television applications.

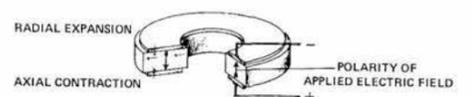
Work on piezoelectric materials and devices is continuing at Sandia in several organizations.



PIEZOMECHANICAL LOCKING MECHANISM invented by Otmar M. Stuetzer (1220) depends upon dimensional changes in ferroelectric discs to lock the insert in the housing. Number of discs can be increased to make unlocking as complex as necessary.



POLARITY of applied electric field here produces radial contraction, axial expansion; disc can now be inserted or removed.



REVERSE POLARITY of applied electric field produces radial expansion to lock the disc in the housing.



SANDIA MOTORCYCLISTS, part of the 100-or-so who ride their bikes to work every day, gather for a group photo. Fighting traffic in an automobile is a chore, they say, while riding a motorcycle is pure pleasure. They love the fresh air (and don't mind rain, sleet or snow).

## 'Worry About Their Image'

# Sandia Cyclists Are Safe, Sane Citizens

An estimated 100 fresh-air-loving employees ride motorcycles to work every day—rain or shine. For most of them, it would take a blizzard to get them inside an automobile.

"Tooling an automobile through traffic is a chore," one cyclist says, "while riding a bike is a pleasure."

This is the prevailing attitude. A motorcycle is fun transportation. And there are a couple of advantages—parking, for instance, is easy. There are motorcycle parking lots close to the main buildings. Operating costs are much, much less than for an automobile. Some of the smaller "bikes" can travel a couple of hundred miles on a tank of gas.

But there are disadvantages—motorcyclists at Sandia worry about their image.

"The Hell's Angels and a couple of way-

out movies have made us all hoodlums in the eyes of the public," the cyclist says. "This is the old story about judging a basket of apples on the basis of the one rotten one."

National statistics show that motorcyclists suffer considerably fewer accidents per passenger mile than autoists.

"We're not wild," the cyclist says, "if anything, we worry about safety more than the guy driving a car. We have to, we're vulnerable."

As a result, motorcyclists practice defensive driving as a way of life. He is thinking ahead, aware constantly of the traffic patterns in front of and behind him. He assumes that other drivers cannot see him and he is alert for potential dangers.

On weekends, most of the cyclists head for the hills. This is where the motor-

cyclist can get away from the traffic, traverse trails that were designed for mules, and really see the open country. The trail cyclist can cover more territory in a day than a hiker or horseman can cross in a week.

Within the ranks of the cyclists, there are special words to describe "the one percenters"—members of the minority of disreputable cyclists who give the others a bad image. "Tree climber" is the term for a reckless driver destined to wind up in a tree or wrapped around a pole. "Ape hanger" describes the use of extra high handlebars that actually reduce a rider's ability to control his machine.

We're not aware of any "one percenters" in the Sandia ranks. Clean shaven and wearing business suits, the Sandia cyclists look pretty respectable — albeit a little wind-blown.

## Service Awards

## 20 Years



D. S. Bliss  
7432



J. H. Burns  
8183



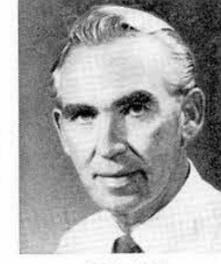
Frank Castillo  
7351



Teddy Chavez  
4222



L. E. Cox  
4221



D. L. Fastle  
7226



J. R. Halliday  
9235



R. J. Kraus  
4335



H. L. McKinney  
4513



J. K. Merillat  
3251



N. S. Perea  
4641



R. G. Piper  
4543



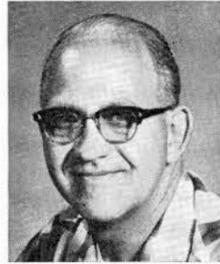
J. C. Robinson  
7422



A. L. Romero  
4644



G. C. Ryan  
7334



B. E. Van Sickle  
4213



J. M. Winter  
4513

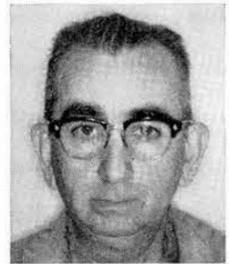
## 10 Years

Sept. 20-Oct. 3

A. U. Camp 7415, R. J. Thompson 1722, B. A. Worden 8331,

D. J. Gallagher 8161, Ellen P. Arnhart 9411, A. T. Kersey 4514, R. L. Ridsdale 7351, W. C. Jacoby 9232, Margaret G. Weitzel 3126, C. W. Green 7322, B. D. Thompson 4511, C. J. Pignolet, Jr. 8154, L. W. Busch 4254, J. H. Formea 4545, and Ada Jane Akin 2300.

## Death



Abram C. Grose, a specialties worker in the Ceramics Shop, Specialties Division B 4222, died Sept. 9 after a long illness. He was 57.

He joined Sandia Laboratories in June 1955.

Survivors include his widow and a son.

## If You Win, Call Us

Any Sandian who takes a prize in the New Mexico State Fair competitions is asked to contract SANDIA LAB NEWS office, Bldg. 800, Rm. 112, tel. 264-7841.

## Events Calendar

Sept. 20-22—New Mexico State Fair.  
Sept. 26-28—"Fiddler on the Roof," UNM Concert Hall.  
Sept. 26-29—"Bell, Book and Candle," Old Town Studio, 1208 Rio Grande NW.  
Sept. 28—Football, UNM vs. Arizona.  
Sept. 29-30—San Geronimo Fiesta at Taos Pueblo.  
Sept. 29—Fourth of July Canyon in the Manzanos, maple trees in fall colors. N.M. Mountain Club, leader A. H. Zachmann, tel. 299-6871.  
Oct. 4—Saint's Day celebration, Nambe Pueblo.

## Sympathy

To Arthur (4232), Charles (4574), James (4643) and Robert (4252) Becker for the death of their mother, Sept. 9.

To John Paul Stark (9413) for the death of his mother, Aug. 26.

To M. Kitty Weston (1713) for the death of her mother in Mississippi, Aug. 24.

## 15 Years



B. K. Laskar  
3432



J. L. Rogers  
2627



R. Schellenbaum  
9141



S. D. Shane  
4512

## SHOPPING CENTER

### CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. A maximum of 125 ads will be accepted for each issue.

### RULES

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Corporation and AEC employees only
6. No commercial ads, please
7. Include name and organization
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

### FOR SALE

#### CARS & TRUCKS

MECHANICS SPECIAL: '59 Studebaker station wagon, needs work. Murfin, 268-7636.  
'55 BUICK Riviera 2-dr., HT, AT, R&H, 3-tone paint, w/tires, \$295 Bassett 898-1840.  
'66 IMPALA station wagon 2-seat, V8 standard, radio, heavy-duty radiator & suspension 22,000 miles. Moore, 298-8909.  
'60 CHEVROLET, 4-dr., V8, AT, \$400. Cashen, 298-8828.  
'55 PONTIAC station wagon, Hydromatic shift, R&H, new tires, make best offer. Wladika, 255-9166.  
'62 GMC-V6, AT, PS, AC, R&H; 8 1/2' Tear Drop camper. Holloman, 344-3274 after 6.  
'58 DODGE 4-dr. sedan, AT, PS, R&H, original owner, blue & white, \$250. Anderson, 255-3367.  
'60 FORD 2-dr. sedan, Custom 6-cyl., std. trans. w/OD. Skillen, 298-5150.  
'67 BUICK Sportwagon, front disc brakes, PS, AC, AM-FM radio, many safety features, 23,000 miles \$2645. Schmierer, 299-2352.  
'62 CHEVY station wagon, original owner, stick shift, PS, 6-passenger, below NADA at \$700. Moore, 299-3758.  
DODGE Phoenix fordor, AT, V8 motor, \$90. Lawrence 299-9118.  
'67 CHEVROLET Bel-Air V8, 3-seat station wagon, AC, AT, PS, PB, 327 engine, etc., 15,000 miles, \$2450. Hart, 299-8832.  
'55 STUDEBAKER Commander, 4-dr., stick. Lowe, 11404 Bellamah NE, 299-7725.  
'68 CHEVROLET Impala 4-dr., PB, PS, AC, 8000 miles. Laney, 299-8828.  
'383" DODGE engine with torque-flite trans. (out of a wrecked Polara 500), 45,000 miles. Gibson, 877-5682 after 5:30.  
'60 CHEVROLET 1/2-ton pickup, 6 cyl., AC, wide bed, good tires, \$550. Williams, 298-3823.  
GMC 1/2-ton, 1962, V-6, 4-speed, positraction, short wheel bed, \$785. Bentz, 299-3448.  
'57 FORD Ranchero 292 V-8, 3-speed w/overdrive, \$350. Curtis, 344-8937.

#### MISCELLANEOUS

WESTINGHOUSE DRYER \$25; 3 pr. boys ice skates, sizes 1, 2, & 10, \$4/pr. or all 3 for \$10. Driscoll, 298-4641.  
FREEZER, upright, \$85; auto. washer/dryer, \$30 ea.; TV, \$25; 15 cu. ft. chest freezer, \$100; two refrigerators, \$10/\$65. Lemmons, 243-5855.  
STRING BASS w/cover & bow, \$225. Ray, 299-1253 after 6.  
TAPE RECORDER, portable Craig, 212, battery operated, 7 transistor, auto. level control w/AC adapter; clarinet, B-flat Buffet, \$75, new \$160. Newman, 299-2729 after 5:30.

TRUMPET, King, 2 mouthpieces, music stand, case, \$70; 1/4 interest 1960 Bellanca 260, 3 radios, hangered at Sunport, 250 hrs. SMOH. Mechlenburg, 344-6793.  
DOG, Samoyed, pure bred female, 3 1/2 mos. old, all white Siberian sled dog, gentle & trainable. Taylor, 256-3221.  
ONE SET used encyclopedia, \$125. Hendrix, 299-8872.  
GE 1/3 HP, 1725 RPM. 115V AC motor; snow tire, 7.50x14; baby walker. Leyba, 344-6928.  
STENOGRAPH dictating machine w/5 tapes & 20 books on writing, best offer. Langston, 268-6933.  
3-CUSHION SOFA, Early American style, hard rock maple construction. Pass, 256-9663.  
RABBITS, young breeding does, \$2/ea.; Bundy clarinet & case, \$40. Hart, 268-5077 after 5.  
MINIATURE SCHNAUZER, 1 yr. old, all shots, spayed. Martin, 296-3095 after 12 noon.  
KING SIZE BED frame new, \$12.50. Halbleib, 296-2682.  
GERMAN SHEPHERD PUPPY, male, pick of litter, 8 wks. old. Abbin, 256-0188.  
TIRES: set of 4 Mohawk Radial ply XR-70 tires for 15" rims, \$110, never used, were \$196. Huddleston, 256-3020.  
GUITAR amplifier w/speaker, solid state, \$18. Schreiner, 268-4159.  
NEW PAIR CAMPER JACKS. Newton, 255-2074.  
ELECTRONIC FLASH ultra blitz rocket battery or AC, \$20. Nogle, 299-3863.  
GE range, dbl. oven, each auto timed, \$125; furnace, new, never installed, 80 BTU w/plenums, thermostat & ducting, \$125. Kraft, 296-3991.  
ONE WHEEL BAGGAGE trailer w/bumper brackets, \$30. Gubbels, 299-8089.  
'65 YAMAHA Big Bear scrambler, 5 speeds, 250cc, extra drive sprocket for trail use, \$395. Kuroski, 256-7295.  
WESTINGHOUSE 110v roaster oven, broiler attachment & storage cabinet, \$25; trailer hitch for VW station wagon, \$5. Kaiser, 296-5215.  
LIVING ROOM SET; Hollywood single bed; dinette set. Chavez, 256-1087.  
STEREO TURNTABLE, Voice of Music, w/diamond needle. Kane, 3221 Betts Dr. NE, 298-1717.  
OLDS trumpet, \$40; Olds cornet, \$40; or both for \$75. Clem, 296-5204.  
'66 SEAR'S motorcycle, 106cc, 320 miles, \$290. Johnson, 298-8625.  
LENNOX CHINA, 14 place settings, \$250; man's Swiss self-winding watch, \$25. Gasser, 255-4562.  
SIAMSE KITTENS, Frost Point, \$15. Hayes, 299-1200.  
DAISY BB GUN, model 94 saddle rifle style, \$8. Smailer, 299-8413.  
SEAR'S 30" lawn sweeper, \$12.50; Sear's lawn mower w/catcher, \$5; typewriter stand, \$5. May, 299-2624.  
'65 YAMAHA 80cc, trail & street, \$140. Brubaker, 268-0875.  
ROTH violin & case, full size, \$100. Roussel, 898-0721.  
MISC. camping equipment. Chapman, 299-3946.  
DOUBLE BED w/walnut headboard, \$65; couch & matching chair, \$115; other overstuffed chairs & furniture. Chandler, 296-3323.  
LARGE LUGGAGE CARRIER; beginner's accordion, 12 base, \$15; Ward's tent trailer. Stixrud, 298-0478.  
BICYCLE, girl's 24" Murray w/basket, \$15. Coleman, 299-2377.

'65 JAWA 350cc customized, 3100 miles, \$350; factory built camper trailer chassis, 15" wheels, hydraulic brakes, \$150. Shock, 877-3728.  
DBL. BED, nearly new mattress; 40" electric range; vacuum cleaner w/attach.; blond coffee table; lg. hassock. Gendreau, 268-3436.  
SILVERTONE B&W TV, \$40. Northrup, 298-9933.  
PARADE DRUM w/case, music stand, \$12. Illing, 298-7189.  
'65 MARLETTE mobile home, 10x50 w/expanding living rm. Shoemaker, Bosque Farms, 1-636-2786.  
ROUND dinette table w/10" leaf, oak grained formica top, 2 chairs, \$25; 3-pc. bdr. set, bookcase bed, dbl. dresser & nite stand, frosted mahogany finish, \$125. Smith, 299-1264.  
'65 YAMAHA motorcycle, 80cc, \$145. Dickason, 299-8125.  
BRIGGS & STRATTON engine; animal traveling cage; soap box derby wheels. Weber, 298-1564.  
CORNET, American Standard made by King Craftsmen H. N. White Co., Cleveland, w/case & mouthpiece, \$75, cost \$131.95. 1816 Dorothy N. Cook, 299-6649.  
GAS RANGE, O'Keefe & Merrit, \$25. Tison, 296-5103.  
FREE HALF-BREED Beagle-Poodle pups. Roh, 299-3749.  
ELECTRIC sewing machine, Kenmore, maple cabinet w/matching chair, includes many extra attachments. Leech, 255-0265.  
HOLIDAY stereophonic phonograph, Spear Electronics, Inc., 45-16-33 s-78 speeds, Model #1105 portable, new needle, \$20 or best offer. Pollard, 299-1318 after 5:30.  
'57 MIDWAY TRAILER, 8x50, 3-bdr., trailer, 3 axles, make offer. Montana, 243-0524.  
TWO VIOLINS: full size, \$85; 3/4 size, \$50. Copeland, 344-1133.  
SERVEL refrigerator, \$35. Foster, 282-3975.  
GIRL'S BICYCLE, 20" inch w/training wheels, \$20. Mattox, 296-4149.  
REFRIGERATOR, washer, binoculars, lawn edger, hi-fi speaker in cabinet, nylon pile rugs, table lamps, patio light. All reasonably priced. Lucas, 265-9457.  
STOP WATCHES on clipboard, \$45; oak bunk beds w/ladder, rail, \$50; old wall telephone w/stereo speakers inside, \$65; pecan chest, \$40. Cook, 298-1772 after 5.  
WOOL CARPET and pad, 9'x7', beige, \$20; Gibson guitar and case, F hole, musician or collector's item, \$75. Young, 255-9022.  
SCHOOL BUS seats, 38" wide, \$2.50 each or make offer for all 11. Stanton, 268-9242.  
'67 YAMAHA twin jet 100, less than 1000 miles, \$295. Registered blue point Siamese kittens, ready to take home, \$15. Hughen, 296-2600.  
GUNS: Savage 12-ga. auto.; 30-06 Springfield; 22 cal. conversion kit to .45 Colt auto.; Enfield and Springfield Sporter stock. Martin, 268-5464 after 5:30.  
SNOW TIRES, used one season, 8-00x14; new men's bowling shoes, size 9-C; ladies ice skates, size 5; Sony 500A recorder. Kobs, 298-9133.  
S&W .41 Magnum, new, w/holster, \$100; 6.5mm Swedish Mauser, partially sporterized w/3-8x Bushnell scope, \$65. Reger, 268-9358.  
CAMPER JACKS, Ultra-lift model, set of two, \$55. Hunke, 298-7730.  
FREE KITTENS, gray Persian type, six weeks old. Conn trumpet, used five years. Lynes, 268-0144.  
GAME TABLE, plus built-in chip, ash and drink trays, pool table cloth covered, folding legs, seats 8, 48" dia., new cost \$49, now \$18. Browning, 299-6384.

DESK, 6' long, 26" deep, 8 locking drawers, reasonable; 50' self-supporting tower, 3-element beam rotator and control head. McClure, 268-0720 after 5:30 or weekends.  
BUNK BEDS w/mattresses, oak, wagon wheel design, ladder, rail, \$100. Russell, 299-0159 after 5:30 or weekends.  
COCKER SPANIEL, male, pedigreed, 3 years old, free to someone who thinks he can handle him, he bites. Kepler, 298-5652.  
THUNDERBIRD quick camper, reasonable. Williams, 344-1000.  
TWO-WHEEL trailer, 8" wheels, make offer, trade or cash. Witherspoon, 265-4806.  
GREAT BOOKS of the Western World with Syntopicon, 10 vol. Great Ideas Program, 8 yearbooks and bookcase, \$200. Summers, 298-1001.  
MAPLE trundle beds w/o mattresses, \$20; Ethan Allen maple corner desk, \$50; boxing gloves, \$7.50; 30-amp. arc welder, \$10; gas-powered "grasshopper" model airplane, \$5. Stein, 299-8875.  
RECLINER CHAIR, tan naugahyde, \$30; Hammond Solovox organ attachment for piano, \$130. Riley, 299-3165.  
FOUR 8-55x14 U.S. Laredo whitewall tires, asking \$10 for all, Wagner, 299-2347.  
'66 YAMAHA 305cc, 8900 miles, \$450. Prekker, 299-6468.  
FRIGIDAIRE refrigerator, white, original owner, standard size, not apt. size, 1949 model, \$50. Finchum, 344-1072.  
18" CRAFTSMAN 3/8 hp reel mower, \$20; Expanding dining room table, walnut, seats 8, \$75. Prairie, 255-5248.  
RICHARDS ENCYCLOPEDIA w/yearbooks through 1962. Columbia University course of Literature, 18 vol. Want luggage trailer or cash. Summer, 299-1912.  
GIRL'S BEDROOM set: two twin beds w/brass headboards, matching dresser w/mirror, brass chair to match, linen's, \$100. Gurule, 344-0130.  
DOG CAGE, 8'x4'x4' w/plywood floor, \$20. Tassia, 299-6096.  
OR RENT 15' camping trailer, \$5 a day, \$17.50 minimum; Equival hitch, \$50; half-breed poodle puppies, \$5. Workman, 298-8312.

### REAL ESTATE

ROBERSON 3-bdr., FR, 1 1/4 baths, NE heights, fully landscaped, near shopping centers & schools. Romero, 299-5189.  
4 ACRES, big garage, unfinished house—plumbing & electricity, can live in—1 mile east of Peralta. Skelley, Rt. 3, Box 423 J, Los Lunas, 636-2177.  
3-BDR. BRICK, 1 1/4 baths, DR, dbl. garage, spacious lot, landscaped, near schools, shopping & transportation, draperies, carpet, immediate occupancy. VanDomelen, 299-3674.  
LOT, Glenwood Hills, 160 x 120, take over pmts. \$33.75/mo. Levesque, 299-1213.  
NEAR OLD TOWN, adobe style 3-bdr., 2 baths, 2 fireplaces, built-in kitchen, hw/floors, barn, 2 wells, additional acreage, in country; also 4 acre tract. Reimer, 247-3198.  
3-BDR. HOUSE, 1 1/4 baths, basement, approx. \$300 down, \$100/mo. Bleakney, 1228 Lobo Place NE, 255-8222.  
2 1/2 BDR., hw/floors, corner lot, new roof, covered patio, entrance boat & trailer, \$79 pmts, T&I included, assume \$6800 mrtg. w/substantial down. Fisher, 265-0626.  
3-BDR., paneled den w/fireplace, carpet, dbl. garage, AC, one acre, fenced, near schools, Bosque Park. Snidow 1-636-2633.

3-BDR., 1 1/4 baths, Roberson, carpet, drapes, paneled den w/fireplace, oversized double garage, large patio, landscaped, CFA heat, AC. Hale, 298-1545.  
4-BDR., paneled den, 1 1/4 baths, walled yard, CFA heat, AC, \$15,300. Russell, 299-0159 after 5:30 or weekends.  
3-BDR., den, Mossman, fireplace, 1 1/4 baths, double garage, Cleveland, Del Norte area. Perkins, 298-4546.  
MOSSMAN, 3 bdr., 2 baths, den, large landscaped yard, near schools in Montgomery Park area, below appraisal at \$18,500. Norris, 299-4676.  
5-BDR., 3 baths, mother-in-law quarters adjoining, 2 fireplaces, shop, study, landscaped, zoned heat, AC, courtyard, paneled den, \$33,800. England, 9408 Dona Rowena NE.

### WANTED

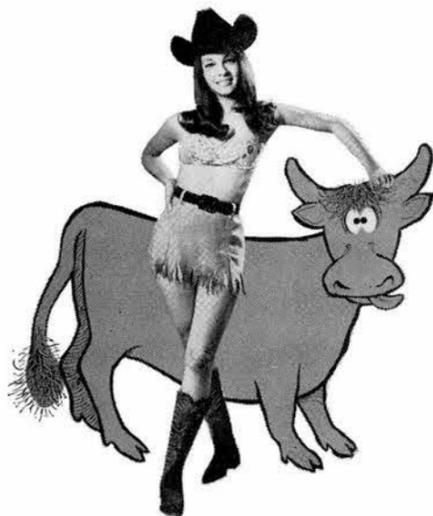
SNARE DRUM in good condition, will consider full set at right price. Dickason, 299-8125.  
INTERPRETER to translate German technical information & instructions from Telefunken literature. Yngst, 268-2896.  
USED go-cart or parts for go-cart. Clem, 296-5204.  
20 GAL. AQUARIUM; electric floor polisher. Aeschliman, 298-7846.  
CAR POOL member, area bounded San Pedro, Montgomery, Louisiana & Comanche. Smailer, 299-8413.  
SOMEONE who can use pair of crutches in good condition, will give away. McMillan, 842-9103.  
FORM OR JOIN car pool vicinity of Comanche & Wyoming NE for Bldg. 880. Thomas, 296-1128.  
MALE w/car to join car pool, vicinity of Ranchos Rd., North 2nd St. to parking lot north of Bldg. 880 or south of Bldg. 894. Aguilar, 898-0897.  
USED ENGLISH SADDLE. Mawhirer, 877-1619 after 4.  
BAND-SAW & bench mounted sander. Bennett, 299-2260.  
USED POOL TABLE. Barton, 255-5491.  
HONDA 305 Scrambler. Miller, 298-1994 after 4 p.m.  
CHILD TO CARE for in my home, will provide meals if desired, NE Heights. Walker, 299-5905.  
BABYSITTING in my home, prefer ages 2-5, want companion for my son, Eubank and Candelaria area. Vigil, 299-7191.  
BABYSITTING in my home, hot lunches, enclosed yard, close supervision. Williams, 344-1000.  
TO SHARE RIDE to Univ. of Albuquerque Tues. and Thurs. for 10:50 class. Tassia, 299-6096.  
20-INCH boy's bicycle. Tucker, 268-4185.

### FOR RENT

UNFURNISHED Roberson, corner Shoshone & Eubank, 3-bdr., FR, utility area, fireplace, \$150/mo., water paid. Wentz, 298-2630.  
2-BDR. & den, attached garage, private, north valley. Valdez, 247-9066.  
2-BDR. and den, AC, walled yard, close to schools and shopping, available Oct. 1, \$98, water paid. Morgan, 256-7994.

### LOST AND FOUND

LOST: 20-yr. tie clasp; red ceramic earring; green sunglasses; pearl earring; bifocal glasses w/gray frames; wrap-around Polaroid glasses; 2 keys on ring w/White Sands emblem; leather card carrier. LOST AND FOUND, Bldg. 610, tel. 264-2757.  
FOUND: towel, swim trunks and tennis shoes; shaving kit; small pocketknife; Cross eversharp; cufflink; headscarf. LOST AND FOUND, Bldg. 610, tel. 264-2757.



BY POPULAR DEMAND, the Coronado Club is repeating favorite social hour buffet menus. By special request, the LAB NEWS is repeating popular Club publicity photos. On the left, Jennifer Rex (4211) advertises tonight's seafood buffet. In the center, Dody Kurtz (4135)

advocates the chuckwagon roast beef scheduled Sept. 27. On the right, Betty Jo Espinosa (3126) beats the drumsticks for the southern fried chicken scheduled Friday, Oct. 4. Social hours start right after work on Fridays. Music for dancing is played from 6 until 9 p.m.

## Authors

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J. M. Peek and T. A. Green (both 5232), "Oscillations in the Total Cross Section for Resonant Charge Transfer in Li-Li<sup>+</sup> Collisions," Vol. 20, page 1419, PHYSICAL REVIEW LETTERS.

R. L. Park (5273) and H. H. Madden, Jr. (visiting professor from Wayne State University), "Annealing Changes on the (100) Surface of Palladium and Their Effect on CO Adsorption," Vol. 11, page 188, SURFACE SCIENCE.

W. J. O'Sullivan (5151) and J. E. Schirber (5150), "Experimental Determination of the Effect of Hydrostatic Pressure on the Fermi Surface of Copper," June 15 issue, PHYSICAL REVIEW; "DeHaas-Van Alphen Study of the 2nd Zone Hole Surface of In," June 17 issue, PHYSICS LETTERS.

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F. K. Truby (5232), "Dissociative Electron Attachment in I<sub>2</sub> Vapor at 295° K," Aug. 5 issue, PHYSICAL REVIEW.

G. A. Samara (5132), "Pressure and Temperature Dependence of the Dielectric Properties of Hydrogen-Bonded Ferroelectrics: LiH<sub>2</sub>(SeO<sub>3</sub>)<sub>2</sub>, KH<sub>2</sub>PO<sub>4</sub>, and Their Deuterated Analogs," Sept. 10 issue, PHYSICAL REVIEW.

L. S. Nelson (5271), "Differences Between the Combustion of Aluminum Droplets in Air and in an Oxygen-Argon Mixture," August issue, JOURNAL OF ELECTROCHEMICAL SOCIETY.

J. M. Phillips (2442), "Computer Programs Design Interface Adapters for Multizine Tester," August issue, EDN Magazine.

R. N. Schowers (2443), "Integrating by Parts," August issue, INSTRUMENTATION TECHNOLOGY.

## Coronado Club Activities

# Three Swinging Social Hours Scheduled

Three swinging social hours featuring the Coronado Club's most popular buffet spreads are scheduled in the next couple of weeks.

Tonight, the seafood buffet, the kind New Mexicans like, will top the menu while the Aristocrats hold the bandstand.

On Friday, Sept. 27, Frank Chewiwie will make the happy music while the Club's famous chuckwagon beef is wheeled out.

Southern fried chicken will be the buffet feature on Friday, Oct. 4. Rex Elder's combo will play for dancing.

Pat Reich and piano will entertain with a sing-a-long in the main lounge each Friday evening from 9 to 12 p.m.

Social hours start right after work with special prices until 8 p.m. The buffet is served from 6 to 8 p.m. Dancing is scheduled from 6 to 9 p.m.

### Football Bus

The bus for the football game between the Lobos and Arizona will leave the Club at 7:30 p.m. on Saturday, Sept. 28. Return to the Club after the game and join the celebration in the main lounge. Social hour prices will prevail.

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### SANDIA LAB NEWS

SEPTEMBER 20, 1968

# Sandia Safety Signals

### Hunter Alert

More people than ever before are wearing thermal insulating clothing for protection against cold. The insulating material, made by quilting layers of synthetic fabrics, is used for both underwear and outer clothing. Many of these synthetics melt under extreme heat and form a hot, sticky mass that clings to skin and causes serious burns. Avoid standing too close to an open flame or camp fire, when wearing thermal duds.

### Danger on 66

On Highway 66 east of Albuquerque, near the entrances and exits to the freeway, police report a significant number of serious accidents. Out-of-state motorists especially are taken unawares by the switch in highways at this point and, braking or turning suddenly at high speed, may lose control. Be alert for this hazard when you travel here.

### Bridge

Duplicate bridge meets Mondays at 7 p.m. Ladies bridge will meet Thursday, Oct. 3, at 1 p.m.

### Wine Taste

Mark your calendar now to attend the Club's fabulous Wine Taste on Saturday, Oct. 5. In addition to the special refreshments, top sirloin steaks with onion rings will be served and Phil Graham will play for dancing. Cost to members is \$3, guests \$3.50.

## Narrow Escape from Blindness Makes Fred Reinhardt 'Wise Owl'

The Sandia chapter of Wise Owl Club of America gained another member last week when Fred W. Reinhardt (2343) was recognized for having avoided injury to his eyes by use of safety glasses. Significantly, the award was made during September, which has been declared sight-saving month by the National Society for the Prevention of Blindness.

Membership in the club is limited to persons who have had very close calls with accidental blindness.

In Fred's case, he was conducting a chemical experiment inside a ventilated hood, behind a pull-down tempered glass door which was open about 10 inches. He was wearing a lab coat, rubber gloves, and safety glasses. Seven flasks had already been filled with trimethylphosphite, but as he poured the chemical into an eighth flask containing magnesium perchlorate, a violent explosion occurred. The employee sustained cuts on his hands and face from the shattered glass door, he felt some ringing in his ears, and the right lens of his safety glasses received several vertical cracks. His eyes were not injured.

Magnesium perchlorate has been used in combination with other organic solvents

### Teen Dance Class

A class in ballroom dancing for teenagers 12 through 16 instructed by Mike Haley will begin at the Coronado Club Saturday, Oct. 5. The course will include ballroom dances as well as latest rock 'n' roll steps.

Cost of the six-week course is \$14 for the first youngster of a family, \$11.50 for the second, and \$9 for additional youngsters of a family. The class will meet Saturdays from 2 to 3:30 p.m. Enroll through the Club office.



MEMBERSHIP in the Wise Owl Club of America was recently awarded F. W. Reinhardt (2343) by L. M. Jercinovic (right), manager of Safety Engineering Department.

for several years; however, this was the first time it had been combined with trimethylphosphite, a chemical which has not been investigated very extensively.

## Promotions

V. T. Huntsman (3243) to Staff Associate Technical  
M. A. Chavez (9411) to Staff Assistant Administrative  
J. M. Garcia (4623) to Material Handler  
S. J. Armijo (4614) to Utility Operator  
N. J. Gallegos (4614) to Utility Operator  
J. Erni, Jr. (4213) to Inspector  
E. J. Montoya (4511) to Serviceman  
P. H. Gabaldon (4233) to Technician  
W. D. Ross IV (8245) to Chauffeur  
S. M. Halleck (8222) to Laborer  
R. J. Lopez (8222) to Laborer  
A. C. Carter (3415) to Mail Clerk  
R. Montoya (3415) to Mail Clerk  
L. D. Archuleta (3415) to Mail Clerk  
H. T. Lee (3415) to Mail Clerk  
G. Lune (3415) to Mail Clerk  
J. C. Smith (3415) to Mail Clerk  
G. Nuñez (2232) to Document Clerk  
C. W. Reno (9411) to Data Processing Clerk  
M. L. Ebaugh (4135) to Calculating Machine Operator  
D. P. Gallegos (3415) to Mail Clerk  
E. R. Herrera (4615) to Service Clerk  
T. M. Padilla (2232) to Microreproduction Equipment Operator  
M. J. Daniel (8243) to Service Clerk  
C. V. Brown (8232) to Library Assistant  
N. J. Adams (5230) to Secretary  
E. L. Neau (8125) to Staff Member Technical  
T. K. Devlin (9226) to Staff Associate Technical  
J. L. Daniel (8233) to Staff Associate Administrative  
B. Villescac (4575) to Laborer  
C. Lovato (4518) to Laborer  
J. Salas (4622) to Receiving Clerk  
F. Fuentes (4615) to Storekeeper  
R. F. Gardner (4233) to Plate Maker  
F. E. Arellano (4631) to Technician  
T. M. Simpson (4253) to Machinist

J. W. Ackerman (8245) to Stockkeeper  
A. B. Harrison (8222) to Electrician  
R. E. Smith (3415) to Mail Clerk  
S. Sena (4623) to Record Clerk  
I. P. Maes (3126) to Secretarial Stenographer  
J. M. Sedillo (3126) to Secretarial Stenographer  
J. A. Swietlik (3126) to Secretarial Stenographer  
J. L. Kay (2526) to Teletypewriter Operator  
G. V. Montano (3421) to Library Assistant  
N. L. Moser (3421) to Library Assistant  
S. H. Stanley (3421) to Library Assistant  
E. L. Chavez (2232) to Reproduction Service Clerk  
B. R. Collins (9411) to Computer Facility Operator  
D. D. Forbes (8253) to Reproduction Equipment Operator  
P. J. Robinson (8242) to Secretarial Typist  
N. M. Martin (8253) to Secretarial Typist  
H. M. McClure (8215) to Service Clerk  
J. H. Spriggs (3350) to Secretary  
J. A. Ryan (5590) to Secretary  
E. E. Ratcliff (5630) to Secretary  
T. D. Dragoo (3463) to Chartist  
L. S. Miller (1422) to Staff Associate Technical  
R. A. Brooks (1317) to Staff Assistant Technical  
G. E. Easley (2622) to Staff Assistant Technical  
P. F. Martinez (7231) to Staff Assistant Administrative  
T. D. Jajola (4253) to Cleaner  
D. Rex (4221) to Cleaner  
L. D. Sandoval (4613) to Stockkeeper  
W. Lucero (4518) to Laborer  
J. R. Marquez (4518) to Laborer  
J. Hart (4221) to Welder  
R. P. Jaramillo (4221) to Welder  
J. D. Rex (4221) to Welder  
S. D. Eyster (4231) to Technician  
R. L. Negus (4254) to Grinder  
T. B. Luna (8222) to Painter  
E. W. Tibbett (8222) to Maintenance Man

J. A. Sanchez, Jr. (7631) to File Clerk  
D. J. Asbury (3415) to Mail Clerk  
G. E. Reid (3126) to Secretarial Stenographer  
D. Vallucci (3126) to Secretarial Stenographer  
D. J. Nieto (4641) to Teletypewriter Operator  
D. H. Rhoden (7632) to Document Clerk  
I. R. Silva (3415) to Document Clerk  
N. O. Vytlicil (1621) to Record Clerk  
E. S. Montoya (7412) to Record Clerk  
C. P. Tafoya (3415) to Mail Clerk  
I. E. Silva (7631) to Service Clerk  
M. R. Jaramillo (4643) to Service Clerk  
M. I. Michaud (1621) to Typist  
U. V. Jaramillo (9415) to Messenger Center Equipment Operator  
M. R. Flower (3421) to Library Assistant  
J. T. Castillo (9411) to Data Processing Clerk  
R. J. Giesse, Jr. (7632) to Microreproduction Equipment Operator  
D. M. Gutierrez (3415) to Mail Clerk  
D. Casares (7631) to Service Clerk  
B. H. Wolf (7631) to Service Clerk  
K. B. Moore (4333) to Senior Clerk  
C. I. Fuller (4331) to Report Clerk  
M. S. Hill (1643) to Data Reduction Clerk  
D. G. Palmer (8253) to Reproduction Equipment Operator  
S. A. Bowen (8153) to Secretarial Stenographer  
G. L. Day (8334) to Secretarial Stenographer  
T. L. Morgan (8253) to Camera Operator  
J. G. Moore (8242) to Mail Clerk  
V. S. Dominguez (8242) to Mail Clerk  
E. J. Renker (4623) to Record Clerk  
L. G. Hayes (3231) to Secretarial Stenographer  
E. S. Harvey (5110) to Secretary  
K. D. Shane (5150) to Secretary  
Y. L. Sharp (5160) to Secretary  
O. W. Davis (7611) to Draftsman  
S. A. Dean (5000) to Secretary